

The Art of Bonsai

By Eugene Howell

A few months ago in the newsletter we began the discussion of what a tree really is and how it does what it does. We learned about the various systems that make up a tree and what one of them, the root system, does. We also began the discussion of the role of the trunk. This email takes-up where that article left-off. If you no longer have the November issue of the newsletter, please let me know and I will email you the first part of this discussion of the various parts of a tree. If you don't remember the first part of the discussion, please go back and review it or this email discussion will not make much sense.

I hope you will recall from the November newsletter that the trunk is made up of five layers. The outside one is the bark, next is the phloem, and the third is the cambium. These were discussed in that newsletter. The discussion of what the cambium does is extremely important for the bonsai hobbyist to understand, so if you remember nothing else from the November newsletter, remember that part.

The remaining layers of the trunk are the xylem and heartwood. The xylem has the task of carrying water and nutrients from the roots to the leaves. The heartwood is dead and provides the strength for the trunk to withstand winds and hold up the weight of the canopy.

Have you ever wondered how a tree grows in diameter? What happens is the cambium (third layer in) continually makes new cells on both its inner and outer surfaces. The cells on the exterior side become phloem and the outside cells of the phloem turn into bark. The cells on the inner surface of the cambium become xylem and as the inner cells of the xylem die, they become heartwood. As a result of this process, the heartwood continues to increase in diameter and the bark increases in total surface area as the tree gains in diameter.

We learned in previous articles that the cambium is made up of meristem cells. These are the only cells in the plant that can change character. As examples; when needed, meristem cells can develop into a bud, into a new leaf, into a root, or into different layers of the tree. The meristem cells at the tips of each branch are the dominant cells in each branch and as they multiply the branch gets longer: thus the tree gets taller and the trunk thicker as a direct result of the cambium layer.

The leaves of a plant have one primary job; to manufacture food for the plant. They do this with the chlorophyll contained in each leaf. The chlorophyll uses the sun's energy, water, minerals, and carbon dioxide to manufacture complex carbohydrates, which are the food for the plant. When a bonsai is defoliated to reduce leaf size, the plant loses the ability to manufacture food until new leaves are produced. You may remember from the November newsletter that one job of the roots is to store food. When all the leaves are removed, the plant extracts this food to keep it going until new leaves are grown. This process is the same that keeps a deciduous tree alive during the winter, when it has no leaves.

The flowers, fruit and seeds are the final three systems of a tree. These play a relatively minor roll in bonsai simply because there is nothing a bonsai artist can do about the size, shape, or color of flowers and fruit. Whatever nature intended them to be, that is exactly what they turn out to be.

The discussions in this email and the November newsletter barely scratch the surface of a fascinating subject that every bonsai enthusiast should know thoroughly. If you don't, then go to Google and bring up some detailed publications and they can complete the picture.